3.4 TERRESTRIAL BIOLOGICAL RESOURCES

This section describes the terrestrial biological resources (i.e., onshore habitats including freshwater habitats) with the potential to be impacted by the proposed Project, including local habitat types, biological communities, and sensitive species as well as invasive species. This section also evaluates the impacts that implementation of the proposed Project may have on these resources.

Analysis in this section focuses on terrestrial biological resources at both the Broad Beach Restoration Area (Project area) and the Off-site Project areas that may be directly or indirectly affected by any of the primary Project components. This analysis is based on information from the California Department of Fish and Game's (CDFG's) California Natural Diversity Database (CNDDB), U.S. Fish and Wildlife Service's (USFWS's) critical habitat map portal, and a number of biological reports pertaining to the Project area and Off-site Project areas.

A *Protocol-level Special Status Plant and Natural Communities Survey* prepared by WRA, Inc. (2011) was the primary source of information regarding vegetation communities in the vicinity of Broad Beach. WRA conducted a background search for potential special-status plant species as well as three floristic surveys and one reconnaissance site visit conducted between November 2010 and September 2011. The protocol-level surveys, which covered 2.46 acres, corresponded to the peak blooming or vegetative period for accurately identifying plant species in coastal dune habitats in Los Angeles County. The field surveys were conducted by a botanist familiar with the flora of dune habitats of coastal California, who followed protocol described by Nelson (1987). The field surveys were limited in that they occurred after the installation of the emergency rock revetment, discussed below. Additionally, they did not include coverage of the dune habitat that is located between the residences and the emergency rock revetment, an area which is considered an environmentally sensitive habitat area (ESHA) as defined by the Malibu Local Coastal Program (LCP).

Additional biological reports used in the following analysis include various biological assessments, including habitat assessments, specific to individual properties on Broad Beach Road. A number of reports, one of which pertained specifically to the globose dune beetle (*Coelus globosus*), a California Special Animal, were prepared specifically to address the property located at 30732 Pacific Coast Highway. These reports were used to characterize the habitat as well as the potential wildlife present within the Project area.

3.4.1 Environmental Setting Pertaining to the Public Trust

Project Area Location and Description

Broad Beach is currently a narrow sandy beach that extends for 6,700 feet from the rocky intertidal habitats of Lechuza Point in the west to the mouth of the Trancas Creek Lagoon in the east (see Figure 3.4-1).

Approximately 114 residences, varying in size and location relative to the beach, are located along Broad Beach. The undeveloped space located between this development and the Pacific Ocean supports a wet sandy beach, which occurs only during low tide, and a degraded coastal dune system. Existing terrestrial habitats within the Project area are located roughly between the seaward side of existing homes and the mean high tide line (MHTL), consisting primarily of open sand, landscaped dune areas, the revetment, and limited dune habitat.

Broad Beach historically supported a wider beach and dune habitat assemblage. As development proceeded and the beach narrowed due to coastal erosion over the last 30 years, both the acreage and quality of dune habitats were reduced. Most recently, from 2008 to 2010, homeowners responded to issues associated with the eroding beach by installing of a series of large sand bag revetments and then by constructing the currently present rock revetment.

Although both of these emergency actions impacted beach and dune habitats through short-term disturbance and direct removal or covering of habitat, such impacts are not well documented, as these actions occurred under emergency permits. Large sand bag revetments appear to have been installed along 4,000 feet or more of beach and such revetments currently extend eastward of the existing rock revetment.

Existing southern foredune habitat at Broad Beach consists of a mix of species such as non-native ice plant and native dune primrose. The least disturbed dune habitat is concentrated on four undeveloped parcels at the east end of the beach.

Sand bags and the rock revetment were installed against or cut into existing dunes along Broad Beach. In many places, an informal sand walkway between homes exists landward of the revetment with periodic links to sandbag or rock walkways across the revetment to the beach.

Figure 3.4-1. Biological Resources in the Broad Beach Restoration Area and Off-site Project Areas

These revetments appear to be 6 to 12 feet in width at the base and 10 to 12 feet in height. Construction appears to have involved keying these structures into the beach and laying them back into the existing disturbed dune habitat. Thus, it is likely that installation led to disturbance, removal, and covering of both beach and dune habitat and had potential additional impacts on any sensitive species that may have been present in the vicinity.

An existing emergency rock revetment, which extends for approximately 4,100 feet within the Project area, is located between the existing dunes and the wet sandy beach.

The installation of a 4,100-foot-long, 31-foot-wide, and 13-foot-high rock revetment in 2010 entailed placement of approximately 36,000 tons of rock, leading to the disturbance, as well as covering, of approximately 3 acres of beach and dune habitat. Consequently, portions of this structure likely impacted the disturbed dune system, which is identified as an ESHA under the Malibu LCP. The installation of this structure may have impacted sensitive wildlife and plant species such as the globose dune beetle, a California Special Animal, and red sand-verbena (*Abronia maritima*), a California Rare Plant Rank (CRPR) 4.2 species, both of which have been documented within the Project area.

Initial construction and installation of sand bag revetments along Broad Beach included limited disturbance of degraded dune habitat along large sections of Broad Beach for the purpose of laying back these revetments.

Emergency construction of 4,100 feet of rock revetment along Broad Beach involved operation of heavy equipment on and placement of more than 36,000 tons of boulders over more than 3 acres of beach and degraded dune habitat.

Location and Description of the Off-site Project Areas

Off-site Project areas include the 3 miles of beach downcoast from the Project area between Trancas Creek and Point Dume, as well as the beaches adjacent to and downcoast of the Ventura Harbor sand trap and Dockweiler State Beach (refer to Figure 3.4-1). Terrestrial biological resources in these off-site areas, including beach and wetland habitats, may potentially be indirectly affected by dredging activities or

changes in longshore sand transport resulting from the proposed addition to or withdrawal of sand from these littoral cells.

Zuma Beach

The Zuma Beach Off-site Project area comprises the sandy beach environment that extends for approximately 3 miles between Trancas Creek Lagoon and Point Dume. It is bordered by access roads and parking lots on its landward side, and includes the Zuma Wetlands, a 6-acre freshwater marsh, which is located northwest of Point Dume and is considered an ESHA under the Malibu LCP.

Ventura Harbor Sand Trap

The Ventura Harbor sand trap Off-site Project area includes Ventura Harbor and the beach extending for approximately 14 miles downcoast to the Mugu Submarine Canyon. This area supports approximately 1 mile of developed beaches and harbor facilities as well as over 3 miles of undeveloped natural beach, which includes the Santa Clara River Estuary and McGrath State Beach. Additional developed beaches, including Mandalay State Beach, occur along approximately 5.5 miles of coastline south of McGrath State Beach and are backed by homes and other developments, including Oxnard Shores, Channel Islands Harbor, and Port Hueneme. South of Port Hueneme, there are approximately 7 miles of generally undeveloped beaches, primarily fronting farmland as well as the Point Mugu Naval Air Station. Sensitive habitat in this region includes a number of dune complexes as well as the Ormond Beach and Mugu Lagoon wetland complexes.

Dockweiler State Beach

The Dockweiler State Beach Off-site Project area includes the sandy beach extending approximately 9 miles downcoast to Redondo Canyon located just north of the Palos Verdes Peninsula. This area includes the El Segundo dunes, which front Los Angeles International Airport, and Dockweiler State Beach, located immediately to the southeast. Further down the coast, the area supports approximately 6 miles of developed beaches, including Manhattan Beach and Hermosa Beach, which abut the Redondo Beach Harbor.

Relationship between Terrestrial Biological Resources and Public Trust Resources

Two Supreme Court cases provide the basis of the wildlife trust doctrine, a branch of the broader public trust doctrine that deals specifically with wildlife. In *Martin v. Waddell* (1842), the court applied English common law to reject a landowner's claim to an oyster fishery that was located under the public waters of the State of New Jersey. Additionally, the same logic was applied to terrestrial wildlife in *Geer v. Connecticut* (1896). In this case, the court held that wildlife was public property. These cases set the stage for modern wildlife management by State agencies, in which States act as

trustees, managing and conserving wildlife resources on behalf of their citizens (Bruskotter et al. 2011). Historical cases that have upheld the wildlife trust doctrine include *People v. Stafford Packing Co.* (1925) 195 Cal. 548 and *California Trout, Inc. v. State Water Resources Control Bd.* (1989) 207 Cal.App.3d 585. A more recent case handed down by the California Supreme Court, *Environmental Protection and Information Center v. California Dept. of Forestry & Fire Protection* (2008) 44 Cal.App.4th 459, also upheld the notion that the public trust doctrine can be used to protect wildlife and is not limited to waterways and water resources. Consequently, impacts to terrestrial biological resources resulting from the proposed Project inherently have the potential to affect public trust resources, as well as the public's use and enjoyment thereof.

Habitat Types within the Project Area and the Off-site Project Areas

The Project area and the Off-site Project areas support three primary terrestrial habitat types including sandy beach, coastal dunes, and estuary. Both the sandy beach and the degraded dune system are important coastal habitat types that often support a number of State-listed threatened or endangered plant and wildlife species. The degraded dune system at Broad Beach is identified as an ESHA under the Malibu LCP. These dunes are a remnant of a more widespread system that historically occurred along parts of the Malibu coastline and elsewhere in Southern California. Additionally, Trancas Lagoon and Zuma Wetlands, both of which are identified as an ESHA under the Malibu LCP, drain portions of the Santa Monica Mountains National Recreation Area, located north of the Project area. These habitats, in addition to those in the off-site Project areas are discussed in more detail below.

Beach and Dune Habitats

Sensitive habitats in the Project area and Off-site Project areas include beach and dune systems. With the exception of a limited beach berm near the Project area's east end, Broad Beach has been reduced to an almost entirely low-tide, wet-sand beach, lacking coastal strand habitat, and associated areas with beach wrack and colonizing plant species. However, as discussed below, the Off-site Project areas support both wider beaches and, within Ventura County, substantial areas of dune habitats.

Dune systems typically consist of a foredune, dune crest, and back dune areas with plant species composition and cover varying by area. Southern foredune habitat generally consists of perennial herbs and low-growing shrubs that occupy wind-blown beach sand and receive salt spray from steady onshore sea breezes. This habitat type occurs along the immediate coast and intergrades with open beach sand on the ocean side, and coastal scrub on the coastal bluffs or often wetlands landward. Southern foredune habitats within the Project area and Off-site Project areas are typically dominated by a mix of native and invasive non-native plant species, including native dune mat species such as red sand-verbena, beach bursage (*Ambrosia chamissonis*)

and beach primrose (*Camissoniopsis cheiranthifolia* ssp. *cheiranthifolia*) and non-native species such as European searocket (*Cakile maritima*) and ice plant (*Carpobrotus edulis*).

Open bare sand habitats occur in the Off-site Project areas along the beaches generally directly adjacent to the ocean. Open sand is subject to tidal action, and is mostly devoid of vegetation due to the frequent movement of substrates. Sandy beaches typically interface with the sandy intertidal, rocky intertidal and seasonally rocky intertidal marine and estuarine habitats.

Existing dunes in the Project area have been substantially altered by historic residential development, coastal erosion, and the installation of both sandbag and rock revetments, with the majority of foredune and dune crest having been eliminated and back dune areas converted to bare ground or landscaped yard space. The exception is the eastern 550 feet of the Project area east of the existing rock revetment, where remnant dune formations, although impacted by sand bag revetments, retain a semblance of natural dune formations. These areas support a mix of native, naturalized, landscaped species, and invasive plant species as discussed below.

Beach and dune habitats within the Zuma Beach Off-site Project area are primarily dominated by sandy beach habitat that is relatively devoid of vegetation, and is heavily affected by human use. However, dune habitat, as described above, can be found in some areas of Zuma Beach, specifically those located to the southeast of the Zuma Wetlands (City of Malibu 1995).

Beaches in the Ventura Off-site Project area include both groomed, developed beaches (e.g., Oxnard Shore and Ventura Harbor) and extensive natural sandy beaches backed by intact dune systems such as at McGrath State Beach and fronting the Ormond and Mugu Lagoon wetlands. Approximately 8 miles of sandy beach within this area supports federally designated critical habitat for the federally threatened and State CDFG species of special concern western snowy plover (*Charadrius alexandrinus nivosus*).

Trancas Creek Lagoon lies at the east end of Broad Beach. Water levels vary seasonally, with approximately 0.50 acre of open water, salt and brackish marsh vegetation on the seaward side of Highway 1 adjacent to the Project area; the lagoon is open to the ocean only intermittently.

Beaches within the Dockweiler State Beach Off-site Project area are generally broad, groomed sandy beaches backed by substantial recreational and urban development. This area also supports federally designated western snowy plover critical habitat, primarily for 5 miles

along the El Segundo dunes and Dockweiler State Beach, with another small area just north of Redondo Beach Harbor.

Wetland and Estuarine Habitats

Coastal wetlands in the Project area and off-site Project areas include brackish and freshwater estuaries. Wetland and estuarine habitat within the Project area is limited to the Trancas Creek Lagoon. However, the Off-site Project areas support more extensive wetland and estuarine areas, including the Zuma Wetlands, located on Zuma Beach, as well as the Santa Clara River Estuary, the Ormond Beach Wetlands, and the Mugu Lagoon, located south of the Ventura Harbor sand trap.

Coastal wetlands include a number of natural communities that share the unique combination of aquatic, semi-aquatic, and terrestrial habitats that result from periodic flooding by tidal waters, rainfall, or runoff. Wetlands provide habitat for a vast array of organisms, including many special-status species. During peak annual migration periods, hundreds of thousands of birds migrating along the Pacific Flyway descend upon these coastal wetlands in search of refuge and food. Coastal wetlands provide a vital link between land and open sea, exporting nutrients and organic material to ocean waters, and harboring juveniles of numerous aquatic species. Water flow in these highly productive communities circulates food, nutrients, and waste products throughout the system (California Coastal Commission [CCC] 2001).

Open lagoons and estuaries in Southern California typically support southern coastal salt, brackish, and freshwater marsh habitats. These wetlands are exposed to marine tidal influences during the winter months, but are isolated during other times of the year as stream flows decline and the sand berm develops. Dominant salt marsh native species include pickleweed (*Salicornia virginica*), saltgrass (*Distichilis spicata*), alkali heath (*Frankenia grandifolia*), spearleaved saltbush (*Atriplex patula*), and alkali weed (*Cressa truxillensis*). Other common species include California bulrush (*Schoenoplectus californicus*), narrowleaved cattail (*Typha angustifolia*), umbrella sedge (*Cyperus eragrostis*), and rushes (*Juncus* ssp.). Non-native species often include brass buttons (*Cotula coronopifolia*), curly dock (*Rumex crispus*), and rabbit's-foot grass (*Polypogon monspeliensis*).

Within the eastern portion of the Project area, Trancas Creek Lagoon supports a mix of southern coastal salt marsh and brackish and freshwater marsh habitats. Trancas Creek Lagoon itself measures approximately 10 acres in area, with approximately 0.50 acres located seaward of Pacific Coast Highway (PCH). This lagoon is created by a sand berm, which limits tidal exchanges and causes the creek to pond during high seasonal flows or during times of tidal inundation or wave run-up. The lagoon supports native species such as California bulrush, pickleweed and alkali heath; non-native species such as brass buttons and tamarisk (*Tamarix* spp.); and substantial areas of open water. Wildlife species known to utilize the lagoon and the sandy beach in the

immediate vicinity include common waterfowl such as mallard (*Anas platyrhynchos*) as well as a number of shorebirds, such as double-crested cormorant (*Phalacrocorax aurilus*) and gulls (*Laridae* spp.). Additionally, western snowy plover, a federally threatened species and a CDFG species of special concern has federally designated critical overwintering and foraging habitat in the immediate vicinity of the lagoon (see Figure 3.4-1). However, the lagoon is not known to support any federally or State-listed fish such as the tidewater goby (*Eucyclogobius newberryi*), a federally endangered species.

Los Angeles County Parks and Recreation Department, under oversight of the CDFG, performs limited breaching of the Trancas Lagoon sand berm to prevent flooding. The lagoon has been impacted by urban development and trash and pollutants from the nearby parking lot are routinely deposited into the lagoon (California Resources Agency 1997). However, the Santa Monica Bay Restoration Commission (formerly known as the Santa Monica Bay Restoration Company) recently approved funding for the acquisition and restoration of Trancas Creek and Trancas Creek Lagoon, in order to restore and maintain a wildlife corridor between upland and sandy beach habitats (Santa Monica Bay Restoration Company 2010). Trancas Canyon has been identified as potential southern steelhead (*Oncorhynchus mykiss irideus*) habitat by the National Park Service (NPS), as Trancas Creek is a perennial stream with healthy riparian habitat and a connection to the marine environment. The NPS would like to work with residents and the city of Malibu to restore this watershed for the purpose of facilitating fish passage (Los Angeles County Flood Control District 2006).

Within the Zuma Beach Off-site Project area, Zuma Creek, located approximately 1.5 miles southeast of Trancas Creek supports a 6-acre freshwater estuary, including associated wetland vegetation (California State Lands Commission [CSLC] 2010). Despite seasonal influences of salt water, the Zuma Wetlands are predominately characterized as freshwater wetland habitat (City of Malibu 1995). Although the creek mouth is currently heavily impacted by urban development, the Zuma Wetlands have historically served as a wildlife corridor and nesting site for a variety of birds and small mammals (Tiszler et al. 1998). In 1997, the Zuma Wetlands underwent restoration, including freshwater marsh, riparian woodland, saltgrass terrace, and locally rare foredune habitats (Tiszler et al. 1998). Additional restoration completed in 2001 included removal of several exotic species, grading, and planting of more than 6,000 native plants (Information Center for the Environment [ICE] 2011). Zuma Creek was recently ranked in the Santa Monica Mountains Steelhead Assessment as being of high importance in the conservation of southern steelhead (Harrison et al. 2005). Consequently, future restoration is planned along Zuma Creek within Zuma Canyon (Los Angeles County Flood District 2006).

Additional wetland habitats occurring within the Off-site Project areas are limited primarily to the Ventura Harbor sand trap area of Project influence located northeast of

the Project area (see Figure 3.4-1). Wetlands in this area include the Santa Clara River Estuary, McGrath Lake, Mandalay State Beach Wetlands, Ormond Beach Wetlands, and the extensive Mugu Lagoon. The Santa Clara River Estuary includes federally designated habitat for both the southern steelhead and the tidewater goby. The Ormond Beach Wetlands, located southeast of the Santa Clara River Estuary also includes federally designated habitat for the tidewater goby. Additional information regarding special status species in these coastal wetlands is discussed in the following sections.

Native Vegetation Communities

Native vegetation communities in the Project area are restricted to remnant, disturbed elements of a native community, and are typically interspersed with invasive or landscape species, such as ice plant as well as open sand (WRA, Inc. 2011). Naturally occurring native communities consist of elements of the dune mat vegetation located on the eastern extent of the Project area (WRA, Inc. 2011). Pure dune mat communities cover approximately 0.04 acre of the Project area, while dune mat interspersed with invasive species covers approximately 0.14 acre of the Project area (WRA, Inc. 2011). Additional native plant species documented within the Project area are listed below in Table 3.4-1.

Table 3.4-1. Native Plants Occurring within the Project Area

Species Name	Common Name
Abronia maritima	red sand-verbena
Achillea millefolium	common yarrow
Ambrosia chamissonis	beach bur
Armeria maritima ssp. *californica*	California sea pink
Baccharis pilularis	coyote brush
Camissioniopsis cheiranthifolia ssp. *cheiranthifolia*	beach evening primrose
Carex praegracilis	clustered field sedge
Conyza canadensis var. *canadensis*	Canadian horseweed
Distichlis spicata	salt grass
Eriogonum parvifolium	coast buckwheat
Fragaria chiloensis	beach strawberry
Heliotropium curassavicum	Heliotrope
Juncus patens	spreading rush
Leptosyne gigantea	giant coreopsis
Leymus sp.	creeping wild rye
Muhlenbergia rigens	deer grass
Rhus integrifolia	lemonade berry

Source: WRA, Inc. 2011.

Landscaped Communities

In addition to restricted elements of dune mat vegetation, several parcels within the Project area support planted native landscape species including field sedge (*Carex praegracilis*), yarrow (*Achillea millefolium*), salt grass (*Distichlis spicata*), beach strawberry (*Fragaria chiloensis*), and dune grass (*Elymus* sp.) (refer to Table 3.4-1). In total, 0.10 acre of native landscaping occurs in the Project area (WRA, Inc. 2011).

Additionally, the majority of parcels have been planted with non-native landscape species, including calla lily (*Zantedeschia aethiopica*), American century plant (*Agave americana*), lion's tail (*Agave attenuate*), Krantz' aloe (*Aloe arborescens*), shrubby daisybush (*Dimorphotheca fruticosa*), pride-of-Madeira (*Echium candicans*), New Zealand hebe (*Hebe speciosa*), and New Zealand flax (*Phormium tenax*). These non-native landscape species cover approximately 0.17 acre of the Project area (WRA, Inc. 2011).

Invasive Communities

The majority of the vegetated regions within the approximately 2.46 acre Broad Beach study area surveyed by WRA, Inc. (2011) are dominated by ice plant, a low-growing prostrate perennial herb that has been widely planted for soil stabilization and landscaping in coastal habitats throughout California. The ice plant mat vegetation alliance is dominated by ice plant and occasionally occurs with pampas grass (*Cortaderia* sp.) (Sawyer et al. 2009). Ice plant and pampas grass are non-native invasive species ranked as high in terms of its negative ecological impact, by the California Invasive Plant Council (Cal-IPC) (Cal-IPC 2012). Pampas grass is a large perennial grass which favors dunes, bluffs, and disturbed areas (Cal-IPC 2012). Additional invasive plant species occurring within this vegetation alliance include calla lily, cape ivy (*Delairea odorata*), and Bermuda buttercup (*Oxalis pes-caprae*) (Sawyer et al. 2009 and WRA, Inc. 2011).

Ice plant is the dominant vegetation in the Project area.

Additional non-native species that have been observed within the Project area include those listed in Table 3.4-2 below.

In addition to the species listed in Table 3.4-2, invasive species occurring in the Off-site Project areas, specifically in the vicinity of the Zuma Wetlands, include Bermuda grass (*Cynodon dactylon*), bristly ox-tongue (*Helminthotheca echioides*), castor bean (*Ricinus communis*), crystalline ice plant (*Mesembryantheme crystallinum*), curly dock (*Rumex*

Table 3.4-2. Non-native Plants Known to Occur in the Vicinity of the Project Area

Species Name	Common Name	Cal-IPC inventory Ranking[1]
Agave americana	American century plant	-
Agave attenuate	Lion's tail	-
Aira caryophyllea	silver hairgrass	-
Aloe arborescens	Krantz' aloe	-
Aloe sp.	aloe	-
Anagallis arvensis	pimpernel	-
Atriplex semibaccata	Australian salt bush	Moderate
Bromus madritensis ssp. *madritensis*	foxtail chess	High
Cakile maritima	European sea rocket	Limited
Carpobrotus eduilis	ice plant	High
Cortaderia sp.	pampas grass	High
Delairea odorata	Cape ivy	High
Dimorphotheca fruticosa	shrubby daisy-bush	-
Echium candicans	pride-of-Madeira	Limited
Erodium cicutarium	redstem filaree	Limited
Euphorbia peplus	petty spurge	-
Foeniculum vulgare	fennel	High
Hebe speciosa	New Zealand hebe	-
Helminthotheca echioides	bristly ox-tongue	Limited
Limonium perezii	Perez's sea lavender	-
Medicago polymorpha	bur medic	Limited
Oxalis pes-caprae	Bermuda buttercup	Moderate
Phoenix canariensis	Canary Island date palm	Limited
Phormium tenax	New Zealand flax	-
Pittosporum undulatum	Victorian box	-
Pseudognaphalium luteoalbum	everlasting cudweed	-
Rhaphiolepis indica	Indian hawthorn	-
Sonchus asper ssp. *asper*	prickly sow thistle	-
Sonchus oleraceus	common sow thistle	-
Zantedeschia aethiopica	calla lily	Limited

Notes: These species were documented at Broad Beach within the 2.46-acre area surveyed by WRA, Inc. (2011); additional non-native species may be present in other areas of the Project area, which were not surveyed by WRA, Inc.

[1]Cal-IPC categorizes plants as High, Moderate, or Limited, reflecting the level of each species' negative ecological impact in California

Sources: Cal-IPC 2012; WRA, Inc. 2011.

crispus), Lamb's quarters (*Chenopodium album*), and rip gut brome grass (*Bromus diandrus*) (ICE 2011). These species, among others, are likely to occur throughout the

Off-site Project areas, including near the Ventura Harbor sand trap as well as Dockweiler State Beach.

Special-Status Species and Invasive Species

Special-status species data was collected from a variety of sources, including the CNDDB, California Native Plant Society's (CNPS's) Inventory of Rare and Endangered Plants of California, and other available literature including information on the presence and distribution of federally or State-listed special status species.

Special Status Plant Species

No State-listed rare, threatened, or endangered plant species are known to occur within the Project area. A number of sensitive plant species listed by CNPS are known or have the potential to occur in the vicinity of the Project area; however, only red sand-verbena has been documented (WRA, Inc. 2011). The Off-site Project areas, particularly Ormond Beach and El Segundo dunes systems, have a far higher potential to support a range of sensitive plants species (Table 3.4-3).

Red sand-verbena. Red sand-verbena is a trailing succulent found mostly on coastal strand from San Luis Obispo County south to Baja California, and blooms between February and November (Hickman 1993). The plant is part of the single dune mat vegetation association, beach bur – red sand-verbena – sea rocket herbaceous association (WRA, Inc. 2011). This vegetation community is located entirely near the ocean edge and is dominated by red sand-verbena and beach bur, with a subdominant presence of sea rocket and beach evening primrose (*Camissoniopsis cheiranthifolia* spp*. cheiranthifolia*) (WRA, Inc. 2011). However, the cover of this vegetation alliance within the Project area is minimal and primarily limited to the eastern end of Broad Beach. Red sand-verbena is also known to occur at Zuma Beach as well as Ormond Beach and Dockweiler State Beach, located within the Off-site Project areas.

Red sand-verbena is a sensitive plant species documented in the Project area; past revetment construction as well as creation of a new dune system may impact individuals of this species. Photograph courtesy of Calflora.

Special Status Wildlife Species

A number of wildlife species inhabit the Malibu coastline and may appear within the Project area. The western snowy plover, California brown pelican (*Pelecanus occidentalis californicus*), and globose dune beetle have all been recently documented

Table 3.4-3. Sensitive Plants Known or Having the Potential to Occur within the Project Area and Off-site Project Areas

Species	Status	Notes/Occurrence
Project Area – Broad Beach[1]		
Abronia maritima red sand-verbena	CRPR 4.2	Present. This species has a high potential to occur within the southern foredune habitat and was observed during the protocol-level rare plant survey.
Camissoniopsis lewisii Lewis' evening-primrose	CRPR 3	Not Observed. This species has a high potential to occur within the southern foredune habitat; however, it was not observed during the protocol-level rare plant survey.
Chaenactis glabriuscula var. *orcuttiana* Orcutt's pincushion	CRPR 1B.1	Not Observed. Though this species has a high potential to occur within the southern foredune habitat, it was not observed during the protocol-level rare plant survey.
Phacelia ramosissima var. *austrolitoralis* south coast branching phacelia	CRPR 3.2	Not Observed. Though this species has a high potential to occur within the southern foredune habitat, it was not observed during the protocol-level rare plant survey.
Off-site Project Area – Zuma Beach[2]		
Abronia maritima red sand-verbena	CRPR 4.2	Present. This species was reintroduced as a part of the Zuma Beach Restoration Plan (1997).
Off-site Project Areas – Ventura Harbor Sand Trap and Areas Downcoast[3]		
Abronia maritima red sand-verbena	CRPR 4.2	Present. This species has a high potential to occur in the Ormond Beach area and was observed during the protocol-level rare plant survey.
Delphinium parryi ssp. *blochmaniae* dune larkspur	CRPR 1B.2	Not Observed. Though this species has a high potential to occur in the southern foredune habitat at Ormond Beach, it was not observed during the protocol-level rare plant survey.
Dithyrea maritima beach spectacelpod	ST CRPR 1B.1	Not Observed. Though this species has a high potential to occur in the southern foredune habitat at Ormond Beach, it was not observed during the protocol-level rare plant survey.
Eleocharis parvula small spikerush	CRPR 4.3	Not Observed. Though this species has a high potential to occur in the wetland habitat at Ormond Beach, it was not observed during the protocol-level rare plant survey.
Erysimum suffrutescens suffrutescent wallflower	CRPR 4.2	Not Observed. Though this species has a high potential to occur in the southern foredune habitat at Ormond Beach, it was not observed during the protocol-level rare plant survey.
Hordeum intercedens Vernal barley	CRPR 3.2	Not Observed. Though this species has a high potential to occur in the southern foredune habitat at Ormond Beach, it was not observed during the protocol-level rare plant survey.

Table 3.4-3. Sensitive Plants Known or Having the Potential to Occur within the Project Area and Off-site Project Areas (Continued)

Species	Status	Notes/Occurrence
Juncus actus ssp. *leopoldii* spiny rush	CRPR 4.2	Present. This species has a high potential to occur in the Ormond Beach area and was observed during the protocol-level rare plant survey.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfield	CRPR 1B.1	Present. This species has a high potential to occur in the Ormond Beach area and was observed during the protocol-level rare plant survey.
Mucronea californica California spineflower	CRPR 4.2	Not Observed. Though this species has a high potential to occur in the southern foredune habitat at Ormond Beach, it was not observed during the protocol-level rare plant survey.
Suaeda esteroa estuary seablite	CRPR 1B.2	Not Observed. Though this species has a high potential to occur in the southern foredune habitat at Ormond Beach, it was not observed during the protocol-level rare plant survey.
Off-site Project Areas – Dockweiler State Beach and Areas Downcoast[4]		
Abronia maritima red sand-verbena	CRPR 4.2	Present. This species has been observed in the immediate vicinity of Dockweiler State Beach.
Camissoniopsis lewisii Lewis's evening primrose	CRPR 3	Present. This species is present in the immediate vicinity of Dockweiler State Beach as well as the El Segundo dunes.
Mucronea californica California spineflower	CRPR 4.2	Present. This has been observed at the El Segundo dunes.
Pholisma paniculaum El Segundo duneflower	CRPR Considered but Rejected	Present. This has been observed at the El Segundo dunes.

Sources: CNPS 2012.
[1]WRA, Inc. 2011.
[2]Psomas and Associates 1997.
[3]WRA, Inc. 2007.
[4]City of Los Angeles 2006; Sapphos Environmental, Inc. 2004.
California State Status
ST - State Threatened (applies to a species that is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens).
CNPS California Rare Plant Rank (CRPR)
1A - Presumed extinct in California
1B - Rare, threatened, or endangered in California and elsewhere
3 - Plants about which CNPS needs additional information.
4 - Plants of limited distribution
0.1 - Seriously threatened in California (>80% of occurrences threatened)
0.2 - Fairly threatened in California (20-80% of occurrences threatened)
0.3 - Not very threatened in California (<20% of occurrences threatened)
Notes: The WRA, Inc. (2011) protocol-level rare plant survey covered only 2.46 acres of the Project area. Additional sensitive species may occur within the Project area, but outside of the WRA, Inc. (2011) survey area.

at Broad Beach (Chambers Group 2010 and Sandoval 2008). Additionally, the California least tern (*Sterna antillarum browni*), which may forage off Broad Beach, may occur in the Project area (Forde Biological Consultants 2005) along with the silvery legless lizard (*Anniella pulchra pulchra*) and the sandy beach tiger beetle (*Cicindela hirticollis gravida*).

Western snowy plover. The western snowy plover was listed as federally threatened in 1993. Additionally, it is a CDFG species of special concern. This species, which includes a coastal and an interior population, breeds on the Pacific coast from southern Washington to southern Baja California, Mexico as well as in the interior areas. The Pacific coast population of the western snowy plover has not been found to have distinct genetic differences from western snowy plovers that breed in the interior USFWS 2007a); however, they are geographically isolated from one another due to a lack of dispersal among the two populations. The Pacific coast population is defined as those individuals that nest adjacent to or near tidal waters, and includes all nesting colonies on the mainland coast, peninsulas, offshore islands, adjacent bays, and estuaries (USFWS 2007a). The coastal population of the species consists of both resident and migratory birds (Warriner et al. 1986). Although some individuals overwinter in the same areas used for breeding, migratory coastal western snowy plovers travel either north or south within their coastal range (USFWS 2007a).

The eastern end of the Project area, as well as the Zuma Beach, Ventura Harbor sand trap, and the Dockweiler State Beach off-site Project areas, support critical overwintering habitat for the western snowy plover. Photograph courtesy of USFWS.

The western snowy plover forages primarily in wet sand at the beach-surf interface and feeds on marine worms, small crustaceans, and insects (USFWS 2007a). This species is most likely to nest in shallow depressions on undisturbed, flat areas with loose substrate, such as sandy beaches and dried mudflats along the California coast. Typically, two to three eggs are laid by each female, and are incubated by both sexes. These eggs hatch in 25 to 30 days and nestlings fledge (i.e., are able to fly) after approximately 1 month (USFWS 2007a). The nesting season for this species can extend from early March through early September, but generally occurs up to 2 to 4 weeks earlier in Southern California (USFWS 2007a).

The decline in the western snowy plover population is primarily attributed to human disturbance, urban development, introduced European beachgrass (*Ammophila arenaria*), and expanding predator populations (USFWS 2007a).

Western snowy plovers are known to occur within both the Project area and Off-site Project areas, along the sandy beach extending from just west of the Trancas Creek Lagoon to Point Dume, where they have federally designated critical habitat (refer to Figure 3.4-1). This segment of beach is an important overwintering location for the western snowy plover, as approximately 130 individuals were documented during a survey in 2004 (USFWS 2005). Additional federally designated critical habitat occurs in the Ventura Harbor sand trap Off-site Project area on the sandy beach extending from the Santa Clara River Estuary to the Channel Islands Harbor as well as in the immediate vicinity of the Ormond Beach dunes. Federally designated critical habitat for the species also occurs in the Dockweiler State Beach Off-site Project area from Marina del Rey to El Segundo Beach (refer to Figure 3.4-1). The essential habitat features in these areas include stretches of sandy beach, generally barren to sparsely vegetated, located both above and below the high tide line terrain (USFWS 2005). In addition to providing habitat conducive to predator avoidance, these features also provide individuals with occasional surf-cast wrack supporting small invertebrates for foraging.

California brown pelican. The California brown pelican was recently delisted under the California Endangered Species Act (CESA) due to increasing populations and increased nesting, primarily at the Channel Islands. However, its classification as a CDFG fully protected species remains. The California Fish and Game Code sections dealing with fully protected species state that these species may not be taken or possessed at any time and no provision of any law shall be construed to authorize the issuance of permits or licenses to take any fully protected species, except in the instance of take resulting from recovery activities for State-listed species.

California brown pelicans were documented by monitoring biologists during construction of the emergency revetment at Broad Beach in 2010. Photograph courtesy of the USFWS.

The California brown pelican, much like any bird in the pelican family (i.e., Pelecanidae), is easily identified by its large body, very long bill, webbed feet, and conspicuously large gular pouch (Burkett et al. 2007). However, this particular species is differentiated by its dark plumage (Burkett et al. 2007). The California brown pelican occurs along nearly the entire length of the Pacific coast, preferring warm coastal marine and estuarine environments. California brown pelicans are chiefly diurnal, and primarily forage in shallow coastal waters or inland seas (Burkett et al. 2007). Roosting also occurs during the day, in groups on sand bars or jetties, or on man-made structures such as piers and docks (Shields 2002).

The California brown pelican has been documented feeding offshore all along the Southern California coastline. Additionally, this species was documented in the Project area during the construction of the emergency rock revetment (Chambers Group 2010). California brown pelican individuals in this region may be dependent on resources located in both the Project area and Off-site Project areas, particularly Trancas Creek Lagoon and the Zuma Wetlands. Further, this species has a high potential to occur in the Ventura Harbor sand trap and Dockweiler State Beach Off-site Project areas.

California least tern. The California least tern was listed as federally endangered in 1970 and State-listed as endangered in 1971. This migratory species is found along the Pacific coast of California, from San Francisco southward to Baja California (USFWS 2009). Its non-breeding range is presumed to be the Pacific coast of North America from central Mexico south to Panama, but robust evidence is lacking (USFWS 2009). Further, populations are localized and have become increasingly fragmented as coastal development continues.

California least terns may be observed flying up and down coastal areas in search of suitable foraging locations; however, nesting within the Project area is unlikely due to the fragmented condition of the coastal dune features and proximity of coastal development and human activity. Photograph courtesy of the USFWS.

This species feeds exclusively on small fish caught in estuaries, bays, and near-shore marine waters (USFWS 2009). Today, nest sites are restricted to a few, defined locations, some of which are artificial and most of which persist only because of strict management (USFWS 2009).

The California least tern is the smallest of the North American terns. Individuals nest in colonies on relatively open beaches kept free of vegetation by natural scouring from tidal action. The typical colony size is 25 pair (USFWS 2006). The California least tern generally arrives in nesting areas in mid-April to early May (USFWS 2006). Pair bonds may form before or immediately upon arrival with well-defined courtship patterns. Nest locations are usually undisturbed open sand, dirt, or dried mud close to estuaries or a dependable food supply (USFWS 2006). California least terns are colonial, creating loose aggregations of nests approximately 10 feet apart with one to four eggs laid in small depressions (USFWS 2006). Their nest is a simple scrape in the sand or shell fragments (USFWS 2009). A typical clutch is 2 eggs and both adults incubate and care

for the young. Fall migration commences between the last week of July and the first week of August (USFWS 2006). Several weeks before the fall migration, adults and young wander along marine coastlines, congregating at prime fishing sites (USFWS 2006).

While California least tern may be observed flying over the Project area, moving up and down coastal areas in search of suitable foraging locations, this area is not considered to be critical habitat or recent breeding habitat, as the conspicuous presence of human activity at Broad Beach limits the potential for nesting colonies within the Project area (Forde Biological Consultants 2005). However, California least terns are known to occur in the Ventura Harbor sand trap Off-site Project area, specifically in the vicinity of the Santa Clara River Estuary, Ormond Beach, and Mugu Lagoon, which is the nearest documented breeding site for this species (Forde Biological Consultants 2005).

Silvery legless lizard. The silvery legless lizard is a CDFG species of special concern. This burrowing reptile is slender, with no legs, a shovel-shaped snout, smooth shiny scales, and a blunt tail (NatureServe 2012). This species lives mostly underground, foraging in loose sandy soil during the day and emerging to the ground surface at dusk or at night. Silvery legless lizards primarily eat larval insects, beetles, termites, and spiders, concealing themselves beneath leaf litter or substrate before ambushing their prey. This species typically inhabits sand or loose soil in a variety of habitats, including areas with sparse vegetation such as beaches, chaparral, pine-oak woodland, and riparian areas characterized by sycamores (*Plantus* spp.), cottonwoods (*Populus* spp.), and oaks (*Quercus* spp.) (NatureServe 2012). Silvery legless lizards are also typically found in dune habitats, specifically in areas with bush lupine (*Lupinu*s spp.) and mock heather (*Ericameria ericoides*), which are habitat indicators for this species (NatureServe 2012). Further, silvery legless lizards are often present in greater densities in areas where soil moisture is greater and in lower densities where soils are disturbed and ice plant mats occur (Kuhnz et al. 2005).

While the silvery legless lizard has been documented in the Ventura Harbor sand trap off-site Project area, especially in the vicinity of McGrath Lake, it has not been documented within the Project area. However, this species is known to co-occur with ice plant, and has been found in similar coastal dune habitat. Photograph courtesy of California

The silvery legless lizard has been documented in the Ventura Harbor sand trap Off-site Project area in the immediate vicinity of McGrath Lake. It has not, however, been

documented on Broad Beach, Zuma Beach, or in the vicinity of Dockweiler State Beach. Although this species has not been documented during biological surveys within the Project area (i.e., 30732 Pacific Coast Highway) (Forde Biological Consultants 2005), the silvery legless lizard has been found within similar coastal backdune habitat and may occur within other areas along the Malibu coastline (Broughton et al. 2006), including the Off-site Project areas downcoast.

Southwestern pond turtle. The southwestern pond turtle (*Emys marmorata pallida*), a CDFG species of special concern, is a subspecies of the western pond turtle (*Emys marmorata*). The southwestern pond turtle is a genetically distinct subspecies of the western pond turtle and is found south of San Francisco Bay (Lovich 1998). Historically, this subspecies had a relatively continuous range along the Pacific slope drainages from southern Washington to Baja California (Lovich 1998). Habitat requirements for this species include still or slow-moving water and the availability of aerial and aquatic basking sites. The reproductive biology of the species is poorly known (Lovich 1998). Courtship and mating have been observed in the field during most of the year except December and January, while nesting extends from late April through August with a peak in late May and early July (Lovich 1998). Southwestern pond turtles eat a variety of food items including algae, plants, snails, crustaceans, isopods, insects, fish, and frogs (Lovich 1998).

The southwestern pond turtle has been documented in Trancas Canyon just north of Trancas Lagoon, as well as in the Santa Clara River Estuary, located within the Ventura Harbor sand trap off-site Project area. Photograph courtesy of the Bureau of Land Management.

The greatest single threat to this species is habitat destruction. Over 90 percent of the wetland habitats within its historic range in California have been eliminated due to agricultural development, flood control, and water diversion projects as well as urban development (Lovich 1998). The southwestern pond turtle has not been observed in the Project area; however, this species has historically been documented in Trancas Canyon, just upstream of the lagoon. Further, additional records of the species have been documented in the Ventura Harbor sand trap Off-site Project area, specifically in the vicinity of the Santa Clara River Estuary.

Tidewater goby. The tidewater goby was listed as a federally endangered species in 1994 and is a CDFG species of special concern. The tidewater goby is a small estuarine fish reaching only 2 inches in length. Preferred habitat for this species includes lagoons, marshes, and tributaries with tidal influence between Del Norte County and San Diego County, California (USFWS 2007b). The tidewater goby resides

in coastal streams within 2 miles of the ocean and characterized by slow, shallow, brackish water (USFWS 2007b). They usually inhabit water bodies with a salinity content less than 12 parts per thousand (ppt); however, they can tolerate salinities up to 28 ppt (Swift et al. 1989). This species feeds on small aquatic invertebrates and insect larvae (USFWS 2007b). The majority of tidewater gobies live only one year, making this species highly sensitive to adverse environmental conditions during the breeding season (USFWS 2007b).

While the tidewater goby has not been documented at Trancas Creek Lagoon, proposed federally designated critical habitat for the tidewater goby is located at Zuma Wetlands, which has recently undergone extensive restoration. Photograph courtesy of USFWS.

Although this species has not been documented in Trancas Creek Lagoon or the Zuma Wetlands, it has been documented in the nearby Malibu Lagoon. Furthermore, new proposed critical habitat for this species includes the Zuma Wetlands, which may provide habitat for dispersal of tidewater goby individuals. Further, the Zuma Wetlands are identified in the tidewater goby recovery plan as a potential introduction site, as this water body could provide habitat for maintaining the tidewater goby metapopulation in the region. Additionally, the tidewater goby has federally designated critical habitat in the Ventura Harbor sand trap Off-site Project area, including the Santa Clara River Estuary as well as the Ormond Beach Wetlands (see Figure 3.4-1).

Southern steelhead. The southern steelhead was listed as federally endangered in 1998 and is a CDFG species of special concern. Most steelhead populations within the Southern California steelhead distinct population segment (DPS) have been severely reduced, particularly near the southern extent of their range in the vicinity of the Santa Monica Mountains (National Oceanic and Atmospheric Administration [NOAA] 2011). Land use in these watersheds is highly variable; however, typically the lower reaches along the coast are highly urbanized and are characterized by a loss of estuarine habitat.

Although southern steel head does not occur in the Project area, the Santa Clara River in the Ventura Harbor sand trap Off-site Project area is federally designated critical habitat for this species. Additionally, restoration efforts in Trancas Canyon as well as Zuma Canyon have focused on bringing southern steelhead runs back to these creeks. Photograph courtesy of NOAA.

The southern steelhead is an anadromous salmonid species, which can live up to six years (NatureServe 2012). In freshwater systems these fish feed primarily on insects and fish; however, in the ocean their diet consists primarily of fish and crustaceans (NatureServe 2012). Southern steelheads are capable of adapting to a wide range of environmental conditions (NatureServe 2012). They utilize all portions of a river system, including the estuary at the mouth, and the spawning and nursery areas in the headwaters, to complete their life cycle (NOAA 2011). Consequently, southern steelheads require access between marine and freshwater environments, usually provided by a lagoon, or other estuary system.

While southern steelhead have been documented in the nearby Malibu Creek, this species has not been observed in Trancas Creek or Zuma Creek, likely due to the barriers to fish passage, which exist in the higher reaches. However, both Trancas Creek Lagoon and the Zuma Wetlands are both considered ESHAs under the Malibu LCP, and have been identified by NPS as potential southern steelhead habitat, which has led to a number of restoration efforts, particularly in the vicinity of the Zuma Wetlands. The NPS has also identified Trancas Creek for restoration efforts which would include the removal of barriers to fish passage. Additionally, federally designated critical habitat for this species occurs in the Santa Clara River, within the Ventura Harbor sand trap Off-site Project area (see Figure 3.4-1).

Special Status Invertebrate Species

Globose dune beetle. The globose dune beetle, a California Special Animal, is one of four species of dune beetles restricted to coastal sand dunes and beaches along the Pacific coast. Its distribution covers coastal dunes from Bodega head in Sonoma County to northwestern Baja California (Sandoval 2008). However, despite its large distribution, the habitat requirements of the globose dune beetle restrict this species to the narrow fringe of foredunes immediately adjacent to the ocean and immediately above the mean high tide line (Sandoval 2008). This species, similar to the other three coastal dune beetles, is strongly fossorial (i.e., burrowing). It spends nearly its entire life burrowing in loose sandy areas among common dune plants such as sand verbena, beach bur, and sea rocket (Broughton et al. 2006). Adults and

The globose dune beetle, a California Special Animal, has been documented within the Project area and may have been impacted by past emergency revetment construction. This species may also be impacted by construction of the new dune system. Photograph courtesy of Kevin Lentz.

larvae are sometimes found in open sandy areas, but more typically are found in the sand a few inches beneath the plants (Broughton et al. 2006).

Globose dune beetles occur in foredune habitats at 30732 Pacific Coast Highway, which is located at the eastern extent of the Project area (Sandoval 2008). Sandoval (2008) found that globose dune beetle individuals were most abundant on the front and top of the foredune ridge, specifically where native vegetation was present. Further, Sandoval (2008) found that individuals were less abundant at sites that were irrigated, and when houses were present the distribution of individuals was shifted lower on the beach.

In addition to their presence in the Project area, globose dune beetles have been documented in the vicinity of the Zuma Wetlands (Broughton et al. 2006), as well as at Ormond Beach and Point Mugu dunes within the Ventura Harbor sand trap Off-site Project area and at the foredunes bordering Dockweiler State Beach in the Dockweiler State Beach Off-site Project area.

Sandy beach tiger beetle. The sandy beach tiger beetle, a California Special Animal, occupies sandy beaches and coastal scrub habitats near estuaries in central and Southern California (Broughton et al. 2006). This species can be found in moist sand near the ocean, including swales behind dunes or upper beaches beyond normal high tides (Broughton et al. 2006). Adult sandy beach tiger beetles are carnivorous and feed on flies as well as other insects common in the tidal zone (NatureServe 2012). The species' range has been drastically reduced from its former reach across Southern California. Threats to this species include coastal development, exotic plants, and heavy recreation use of shore areas (NatureServe 2012).

Sandy beach tiger beetles have a high potential to occur within the Project area. Additionally, they are ubiquitous in the Off-site Project areas, occurring at the Ormond Beach and Point Mugu dunes as well as McGrath State Beach and Port Hueneme in the Ventura Harbor sand trap area. This species also occurs downcoast at the El Segundo Dunes and Redondo Beach in the Dockweiler State Beach Off-site Project area. Photograph courtesy of Bug Guide.

The sandy beach tiger beetle has not been observed at the 30732 Pacific Coast Highway property, where the globose dune beetle was identified (Sandoval 2008); however, focused surveys for this species at Broad Beach have not yet been completed. The sandy beach tiger beetle does have a high potential to occur within the

Project area due to the occurrence of potential habitat (Broughton et al. 2006). The sandy beach tiger beetle is also ubiquitous in the Ventura Harbor sand trap and Dockweiler State Beach Off-site Project areas.

3.4.2 Regulations Pertaining to the Public Trust

Biological resources in and around the Project area are governed by a variety of State and local laws, regulations, and policies, which are summarized below. Additional specific policies pertaining to biological resources can be found in Section 3.5, *Land Use, Recreation, and Public Access*.

State

California Coastal Act

The California Coastal Act serves to protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean for environmentally sustainable and prudent use by current and future generations.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act provides a comprehensive water-quality management system for the protection of California waters and regulates the discharge of oil into navigable waters.

Water Quality Control Plan

The proposed Project falls under the jurisdiction of the Los Angeles Regional Water Quality Control Board, which has established a Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

California Endangered Species Act

The CESA parallels the main provisions of the Federal Endangered Species Act (ESA) and is administered by the CDFG.

California Department of Fish and Game Code

The California Game and Fish Code, enforced by the CDFG, provides for the protection of State-listed rare, threatened, or endangered species. Additionally, it outlines regulations regarding hunting and fishing as well as regulations regarding the general conservation of wildlife, plants, and habitat.

Local

Malibu Local Coastal Program

In conformance with the California Coastal Act, the Malibu LCP aims to achieve wise use of the land and water resources of the coastal zone giving full consideration to ecological, cultural, historic, and aesthetic values as well as to the need for economic development. The goals of the Malibu LCP are to 1) protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone; 2) assure balanced utilization and conservation of coastal zone resources; 3) maximize public access to the coastal zone; 4) assure priority for coastal-dependent and coastal related development over other development on the coast; and 5) encourage State and local initiatives to implement planning and development for mutually beneficial uses.

Malibu General Plan

California State law requires each city and county to adopt a general plan for its physical development, and development of any land outside its boundaries which bears relation to its planning. The general plan is a local agency's constitution for future development. The city of Malibu General Plan provides a vision statement as well as a mission statement and further provides policies to guide development and change by identifying common goals, objectives, and programs.

Malibu Municipal Code and Zoning Ordinance

The city of Malibu has adopted a Municipal Code and Zoning Ordinance, the stated purpose of which is to promote and protect public peace, health, safety, and welfare, and to guide growth and development in keeping with the General Plan.

3.4.3 Public Trust Impact Criteria

Impacts to terrestrial biological Public Trust Resources would be considered substantial should implementation of the proposed Project result in one or more of the following:

- Potential for any part of the population of a State threatened, endangered, or candidate species to be directly or indirectly affected or disturbed;
- "Take" of a State-listed endangered, threatened, regulated, fully protected, or sensitive species;
- Prolonged disturbance to or destruction of, the habitat of a species that is recognized as biologically or economically significant in local or State policies, statues, or regulations;
- Net loss in the functional habitat value of a ESHA, including southern foredune, beach, coastal lagoons or estuaries, sea bird rookeries, or other areas of special biological significance;

- Permanent change in the community composition or ecosystem relationships among species that are recognized for scientific, recreational, ecological, or commercial importance;

- Permanent alteration or destruction of habitat that precludes reestablishment of native biological populations; or

- Interference with established native resident or migratory wildlife corridors or the use of native wildlife nursery sites.

3.4.4 Public Trust Impact Analysis

Impact TBIO-1: Impacts to Terrestrial Biological Resources Resulting from the Installation of the Rock Revetment

Installation of the rock revetment resulted in direct adverse impacts to dune habitat, considered an environmentally sensitive habitat area (ESHA) under the Malibu Local Coastal Program (LCP), as well as to sensitive species such as the globose dune beetle (Substantial, Class S).

Impact Discussion

Installation of the temporary emergency rock revetment in 2010 resulted in a number of direct and indirect substantial adverse impacts on both the sandy beach and dune environments within the Project area. As the rock revetment was constructed under emergency permits, environmental analysis was not completed prior to its installation, which limits the information available regarding its impact on terrestrial biological resources. However, as discussed below, adverse impacts resulting from the installation of the emergency rock revetment likely included the potential take of sensitive wildlife and plant species as well as the reduction in sandy beach foraging habitat, and the reduction in the functional value of the coastal dune system.

The emergency rock revetment was placed directly onto the dune system fronting the Broad Beach properties, which is considered ESHA under the Malibu LCP (refer to Figure 3.4-1). While the dune system was of variable quality due to past disturbance (e.g., installation of revetments and the introduction of non-native species), it was directly and adversely affected by the installation of the emergency rock revetment. Operation of heavy equipment and construction personnel over these dunes led to trampling or destruction of native dune vegetation and the installation of the emergency revetment likely resulted in additional take of sensitive wildlife and plant species, including globose dune beetle and red sand-verbena, both of which have been observed within the Project area (Sandoval 2008 and WRA, Inc. 2011). The installation of the emergency revetment also displaced a small amount of critical overwintering habitat for western snowy plover, which stretches from the eastern extent of Broad Beach along Zuma Beach to the east (USFWS 2005).

The installation of the revetment also adversely affected the functional value of the coastal dune system by disrupting coastal processes such as the natural interchange of sand between the sandy beach and dune environments as well as dune mobility by fixing this system's seaward edge. This substantial alteration of existing natural coastal processes in the area interferes with the ability of the dune system to contract or expand in response to long-term natural cycles such as Pacific decadal oscillation, consequently altering the natural functioning of this system over the long-term.

Avoidance and Minimization Measures

AMM TBIO-1a. Implementation of a Comprehensive Dune Restoration Plan. The Applicant shall prepare and implement a comprehensive dune restoration plan, which shall include the creation of a new coastal dune system approximately 55 to 102 feet in width and 20 feet in height. The dune restoration plan shall include, but not be limited to the following measures, described more fully in the conceptual restoration plan provided in Appendix C of CSLC's *Analysis of Impacts to Public Trust Resources and Values.*

- The comprehensive dune restoration plan shall include a landscape plan that details specific planting plans, with native vegetation specific to foredune, dune crest, and back dune habitats.
- The plan shall outline specific measures associated with invasive species removal in both private yards as well as in the degraded dune system on public land. It shall also outline specific measures regarding native revegetation, highlighting details regarding appropriate planting densities and planting methods.
- The plan shall outline long-term monitoring and maintenance activities, including monitoring and survey methods as well as detailed monitoring and maintenance schedules.
- The plan shall address public and private access control and maintenance in the vicinity of the restored dune system.

Additional Plan Requirements and Timing

The comprehensive dune restoration plan shall be subject to review and approval by CSLC, the California Coastal Commission (CCC), the California Department of Fish and Game (CDFG), and the city of Malibu. Prior to the approval of the proposed Project, the Applicant shall file a performance bond with the CSLC to complete restoration and maintain plantings until pre-established performance criteria are met. Permits from other regulatory agencies (as necessary) shall also be obtained prior to Project implementation.

Monitoring

A qualified local biologist approved by the CSLC shall monitor implementation of the comprehensive dune restoration plan for

compliance. Monitoring and maintenance shall be confirmed through site inspections and detailed in annual monitoring reports, which will be submitted to the CSLC, the CCC, the CDFG, and the city of Malibu.

Rationale for Avoidance and Minimization Measures

The installation of the emergency rock revetment resulted in substantial adverse impacts, including the displacement and covering of 3 acres of beach and dune habitat as well as the likely take of sensitive wildlife and plant species, which cannot be mitigated. However, while this impact cannot be mitigated, implementation of AMM TBIO-1a would serve to reduce long-term adverse impacts to the functional value of the dune system. Implementation of AMM TBIO-1a would require that the dunes be restored to a state of greater ecological value relative to their state prior to the installation of the emergency rock revetment. Success of the implementation of AMM TBIO-1a would be based on the achievement of success criteria outlined in the conceptual dune restoration plan (see Appendix C) and further defined in the comprehensive dune restoration plan.

Impact TBIO-2: Short-Term Construction Impacts to Terrestrial Biological Resources

Construction activities associated with beach nourishment and dune creation may adversely impact existing sandy beach and foredune habitats as well as the Trancas Creek Lagoon (Unsubstantial with Implementation of Avoidance and Minimization Measures, Class UI).

Impact Discussion

Short-term construction associated with the nourishment of Broad Beach would involve discharging sand into training dikes and redistributing it with heavy earthmoving equipment (e.g., bulldozers) for the purpose of grading the beach fills and the dune complex to the required dimensions.

In order to support these Project components, a dredging pipeline would be constructed on the sandy beach environment, adjacent to the coastal foredune (considered an ESHA under the Malibu LCP). Construction equipment and materials for this pipeline would be staged within an approximately 0.25-acre area at the west end of the Zuma Beach parking lot. An additional temporary staging area for dredge pipelines and other miscellaneous light equipment (strictly *excluding* the long-term storage of vehicles or other heavy equipment) may also be established on the beach between the Zuma Beach parking lot and the Trancas Creek Lagoon which is considered an ESHA under the Malibu LCP. Adverse impacts resulting from the construction of the pipeline and the storage of construction materials may include the compaction of sand and the disturbance of wildlife (i.e., avian species) in the sandy beach environment. Specifically the use of the construction staging area would likely have direct adverse impacts on the globose dune beetle and the western snowy plover, both of which have been identified

in close proximity to the proposed staging area location. The construction of the pipeline may also have indirect impacts on the ecology of the Trancas Creek Lagoon, specifically associated with the inadvertent harassment of wildlife. However, as the pipe would not be constructed in the immediate vicinity of the Trancas Creek Lagoon, it would have no direct impacts to the hydrologic processes of this surface water feature.

Additionally, a training dike system, consisting of two dikes—one perpendicular to the beach connected to another parallel to the beach—would be constructed using two bulldozers. Construction of the training dikes would have a substantial impact on the sandy beach environment as it would result in the direct excavation of sand, potentially resulting in the disturbance or take of sensitive wildlife species (e.g., sandy beach tiger beetle). The operation of the training dikes may also attract native and/or non-native nuisance wildlife, as the dikes may provide a local and easily accessible source of nutrients. Additionally, the training dikes may attract sensitive species, including coastal birds, which may also attempt to forage within the training dikes.

The discharge and distribution of sand along Broad Beach may also have substantial adverse impacts on terrestrial biological resources, resulting from sand compaction and burial as well as potential disturbance or take of sensitive wildlife or plant species in ESHA habitat, such as the foredune system. As a component of the sand distribution across Broad Beach, bulldozers would be used to pile sand over the existing revetment and into existing back dune areas, creating dunes of up to 20 feet in height. This activity could result in substantial adverse impacts to sensitive plant and wildlife species, such as red sand-verbena, globose dune beetle, sandy beach tiger beetle, silvery legless lizard, and western snowy plover, all of which have been documented or have the potential to occur within the Project area. Direct impacts to these species could occur through crushing, excavation, or overcovering. Additional mortality of sandy beach infauna species, which is generally considered to be complete when burial exceeds 3 feet (Beach Erosion Authority for Clean Oceans and Nourishment [BEACON] 2007), is also likely to occur as a result of the proposed Project. This would be expected to result in subsequent impacts to shorebird foraging, especially if construction activities are conducted during the spring and summer months when sandy beach invertebrate forage production is greatest (BEACON 2007). Further, increased noise levels would also likely disturb sensitive avian species (BEACON 2007).

Additionally, the proposed Project includes placement of an additional 450,000 cubic yards of sand on the beach in approximately 5 to 10 years. The impacts of proposed renourishment would be similar to those described for the originally proposed Project, except that, as currently conceived, the restored dunes system would remain generally undisturbed and construction impacts would be limited to the sandy beach, reducing, but not eliminating the potential for take of sensitive species. Impacts resulting from the installation of dredge pipelines and training dikes as well as those resulting from the distribution of sand over the beach environment would be similar to the proposed

Project. However, should coastal erosion encroach upon the restored dune habitat, impacts of construction within that newly established habitat could be substantially more severe than for the proposed Project due to the greater likelihood for the presence of sensitive species following the original dune restoration.

Initial and future beach nourishment may adversely impact Trancas Creek Lagoon due to the staging of construction materials and the operation of heavy equipment in the vicinity of this coastal wetland. Adverse short-term construction impacts could lead to potential disturbance of sensitive species using the lagoon and the area in the immediate vicinity, including the western snowy plover, which has federally designated critical habitat in this area (refer to Figure 3.4-1). However, these impacts would be short-term in duration, with sensitive species expected to utilize the area after cessation of construction activities. Further, these activities would not directly impact the hydrologic processes of this surface water feature as no substantial alteration of topography would occur near the mouth of the Trancas Creek Lagoon.

Avoidance and Minimization Measures

AMM TBIO-2a. California State Lands Commission (CSLC)- Approved Biologist and Biological Monitors for Construction Activities. The Applicant shall retain a Project biologist and Project monitors approved by the California State Lands Commission to supervise dredging, sand deposition, and all other construction related activities. The biological monitors shall be present to ensure that damage to any sensitive habitat or sensitive species is minimized and that construction crews strictly comply with all mitigation measures. Additionally, the Project biologist shall complete the following:

- Prior to the commencement of construction-related activities the Applicant shall conduct protocol-level surveys for native plant species, with a special focus on sensitive species, in potential environmentally sensitive habitat (ESHA), beyond that which was surveyed by WRA, Inc. (2011).
- Prior to the commencement of construction-related activities the Applicant shall conduct protocol-level surveys for western snowy plover, silvery legless lizard, globose dune beetle, and sandy beach tiger beetle.
- Where feasible, prior to and during construction, collect and relocate sensitive plant, invertebrate, and reptile species that are likely to be impacted by the proposed nourishment and dune creation activities.
- The Applicant shall have a qualified biologist conduct an additional protocol level survey for western snowy plover and California least tern prior to any construction during the breeding season between March and September. Should breeding individuals be identified, all work within a 300-foot-radius of the nest shall be halted and the

Applicant shall immediately contact the United States Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG). Construction activities within the 300-foot-radius shall resume only with the approval and/or implementation of mitigation measures provided by these agencies.

- Be present during all construction activities that may potentially cross ESHA as defined by in the Malibu Local Coastal Program, including the degraded dunes as well as Trancas Creek Lagoon.
- Ensure the implementation of all measures associated with AMM TBIO-1a, including the complete implementation of the comprehensive dune restoration plan, with associated maintenance and monitoring activities. The biological monitors shall record observations and the Project biologist shall submit a weekly report regarding the implementation of and compliance with all construction-related AMMs. Additionally, this report shall include any relevant biological observations, including a list of species encountered within the Project area. These reports shall eventually be incorporated into a mid-Project Sensitive Biological Resources Report (see AMM TBIO-3c).

AMM TBIO-2b. Sensitive Resources Impact Avoidance. The Project biologist and the Project engineer shall clearly designate all environmentally sensitive habitat areas (ESHAs), including areas within 100 feet of the Trancas Lagoon as "sensitive resource zones" on the Project maps and construction plans. Construction equipment and operations shall be prohibited in these zones to avoid impacts to special-status biological resources. During construction heavy equipment shall be operated in accordance with standard Best Management Practices as well as the following measures:

- Vehicles and construction equipment shall be confined to a pre-defined equipment access path no greater than the minimum width necessary to complete the necessary construction activities.
- In areas of high vehicle traffic on dry sandy beach, driving mats will be laid down prior to the commencement of construction-related activities in order to avoid unnecessary adverse affects to the sandy beach environment.

AMM TBIO-2c. Protect Stockpiles of Excavated Material. Materials excavated in order to install the training dikes shall not be stockpiled with 100 feet of the Trancas Creek Lagoon. Additionally, excavated materials shall not be stockpiled within other environmentally sensitive habitat areas or other sensitive resource zones, including federally designated western snowy plover habitat.

AMM TBIO-2d. Dredge Pipeline Staging Area Location. The pipeline staging area shall not be located in an environmentally sensitive habitat area or otherwise adversely affect a sensitive biological resource.

AMM TBIO-2e. Prohibited Long-term Storage within the Temporary Dredge Pipeline Staging Area. Long-term storage (i.e., in excess of 3 days) of materials in the construction staging area shall be prohibited. Materials staged in this area will be strictly limited to dredge pipeline segments and other miscellaneous light equipment. Staging or overnight storage of vehicles or heavy construction equipment shall be strictly prohibited.

Rationale for Avoidance and Minimization Measures

Implementation of AMMs TBIO-2a through TBIO-2c would reduce short-term construction related impacts on terrestrial biological resources by protecting sensitive resources in the immediate Project area, providing for construction supervision, and requiring restoration of dune habitat.

However, after implementation of AMMs TBIO-2a through TBIO-2c, impacts to terrestrial biological resources from short-term construction activities would be reduced but would still result in the potential for take of sensitive species.

Impact TBIO-3: Long-term Construction (i.e., Backpassing) Impacts to Terrestrial Biological Resources

Future beach maintenance activities, such as backpassing, may impact existing and/or created ESHA including sandy beach and foredune habitats as well as Trancas Creek Lagoon (Unsubstantial with Implementation of Avoidance and Minimization Measures, Class UI).

Impact Discussion

Proposed annual or biannual backpassing of sand to maintain beach widths would involve the use of heavy equipment (e.g., scrapers and bulldozers) to excavate sand from the downdrift, eastern segment of Broad Beach for transport updrift to the eroding segment on the west end of Broad Beach. It is anticipated that backpassing will occur on an annual or biannual basis for the life of the Project (see Section 2.0*, Project Description* for specific backpassing triggers).

Impacts to terrestrial biological resources resulting from backpassing would be similar to those listed under Impact TBIO-2, except that backpassing would be focused on dry sandy beach areas outside of created dune habitats. The excavation of surplus sand, expect to occur on the downdrift, eastern segment of Broad Beach, would result in the substantial and direct disturbance of sandy beach habitat. Adverse impacts resulting from backpassing activities may include the mortality of infauna species due to burial or direct mortality (i.e., crushing via sand compaction) (BEACON 2007), which would be expected to have subsequent impacts on shorebird foraging, especially if backpassing

activities are conducted during the spring and summer months when sandy beach invertebrate forage production is greatest (BEACON 2007). Additionally backpassing would reduce the presence of beach wrack, consequently adversely affecting the wildlife species that depend on it for habitat or foraging material (refer to discussion in Section 3.1, *Coastal Processes*). However, over the long-term, backpassing activities would conserve sandy beach habitat, serving to maintain the proposed width of Broad Beach.

Additional short-term substantial direct adverse impacts resulting from backpassing may include the disturbance of wildlife and the potential take of CDFG species of special concern. Indirect adverse short term impacts include an increase in noise levels, which would potentially disturb avian species (BEACON 2007). Substantial beneficial impacts resulting from backpassing include the long-term preservation of sandy beach and coastal dune habitats, which would otherwise be negatively affected by the subsequent erosion of Broad Beach. Conservation of these habitat types may potentially result in indirect increases in sensitive species, such as the globose dune beetle, sandy beach tiger beetle, silvery legless lizard, and western snowy plover, all of which depend on foredune and beach habitat. Additional beneficial impacts resulting from backpassing include reducing the adverse impacts associated with longshore sand deposition (refer to Impact TBIO-5) in the vicinity of Trancas Creek Lagoon and the Zuma Wetlands, both of which are designated as ESHAs under the Malibu LCP.

Adverse impacts on terrestrial biological resources resulting from backpassing would generally occur within the Project area. While these impacts may potentially be substantial, backpassing activities would also result in substantial beneficial impacts including the conservation of the ESHA, both in the Project area and Off-site Project areas.

Avoidance and Minimization Measures

AMM TBIO-3a. Biologist and Biological Monitors for Backpassing Activities. The Applicant shall retain a Project biologist and Project monitors approved by the California State Lands Commission to supervise backpassing and all other construction related activities. The Project monitor shall ensure that damage to any sensitive habitat or sensitive species within or adjacent to construction zones is minimized. The Project monitor shall conduct the following activities:

- Conduct preconstruction trainings with the construction crew leaders so they can readily identify sensitive plant and wildlife species.
- Conduct preconstruction surveys of the sandy beach and dune habits as well as in the vicinity of Trancas Creek Lagoon.
- Flag the toe of the dune on the seaward side of all foredune vegetation.

- Conduct a preconstruction meeting with all construction crew leaders and construction crew members to discuss the implementation of appropriate mitigation measures.

AMM TBIO-3b. Avoidance of Sensitive Resource Zones and Vegetation. Following the completion of pre-construction biological surveys, the Project biologist shall clearly designate "sensitive resource zones" on the Project maps and construction plans. These zones would include any environmentally sensitive habitat areas (ESHAs) or otherwise sensitive biological resources. Sensitive resource zones are defined as areas where construction would be limited, depending on the particular environmental conditions and construction requirements. No native vegetation shall be impacted or removed during backpassing-related activities.

Wetland areas shall be prohibited from use for disposal or temporary placement of excess sand. All equipment used in or near Trancas Creek Lagoon shall be clean and free of leaks and/or grease. Emergency provisions shall be in place prior to the onset of construction and at all times during construction to deal with accidental spills.

AMM TBIO-3c. Sensitive Biological Resources Report. Following the third complete year of Project implementation, the Applicant shall prepare a Sensitive Biological Resources Report. The report shall include the results of past protocol level surveys as well as biological surveys conducted prior to each backpassing event. The report shall assess the presence of sensitive species and habitat as well as analyze the trends in occurrence of sensitive species or habitat. The document shall also include any biologically relevant information gathered during construction monitoring activities. This report shall be submitted to CSLC and shall be used to direct the timing of future backpassing and nourishment events in order to minimize to the impacts to biological resources to the maximum extent feasible.

Rationale for Avoidance and Minimization Measures

Implementation of AMMs TBIO-3a, TBIO-3b, and TBIO-3c would reduce the negative impacts resulting from backpassing to onshore biological resources by protecting sensitive resources in the Project area, providing for construction supervision, and limiting the extent of construction activities. Implementation of these measures would reduce short-term negative impacts to the extent that the overall impact of backpassing activities would be slightly beneficial, as they would conserve the ESHA.

Impact TBIO-4: Hazardous Spill Impacts to Beach, Coastal Dunes, and Coastal Wetland Biological Resources

An accidental hazardous spill and subsequent cleanup efforts would potentially result in take of special-status species, the loss or degradation of functional habitat values, or cause a substantial loss of a population or habitat of native fish, wildlife, or vegetation (Unsubstantial with Implementation of Avoidance and Minimization Measures, Class UI).

Impact Discussion

Hazardous pollutant spills from construction equipment such as dredges, marine vessels, cranes, and bulldozers could potentially occur during initial nourishment, all renourishment events, and backpassing activities. Throughout the proposed initial 6-month nourishment the potential exists for a hazardous spill to occur, either in the marine environment, subsequently washing ashore, or directly occurring on the sandy beach or dune system. Potentially substantial impacts that may result from a hazardous spill include 1) the take of CDFG species of special concern and 2) the loss or degradation of an ESHA (including existing or created dune habitat as well as coastal lagoons or estuaries, or any other locations that support sensitive special-status species). Small leaks or spills that would be contained and remediated quickly within the Project area would likely have localized minor or negligible adverse impacts on terrestrial biological resources, while larger spills occurring in the marine environment would have the potential to spread over larger surface areas increasing the potential for long-term adverse impacts to terrestrial biological resources in the Project area and Zuma Beach, as well as in the Ventura Harbor sand trap and Dockweiler State Beach Off-site Project areas. Depending on the timing, a hazardous spill in the marine environment may impact wetlands within these areas including the Trancas Creek Lagoon and the Zuma Wetlands. Additionally, depending on its size and location, a spill may also impact coastal wetlands in the Ventura Harbor sand trap Off-site Project area such as the Ormond Beach wetlands, McGrath Lake, and Mugu Lagoon, among others, potentially resulting in adverse impacts to these habitats and any special status species that may utilize them either presently or in the future. Any large spill occurring in the offshore marine environment would require immediate subsequent cleanup in order to reduce to potential impacts on both marine and terrestrial biological resources. The cleanup operation would result in impacts to habitat in the vicinity of the proposed Project, with the extent of disturbance determined by the magnitude of the spill.

Hazardous spills from construction activities on or near the beach, or disturbances resulting from cleanup efforts within the sandy beach and foredune habitats have the potential to affect federally listed species, including the western snowy plover and California least tern, among other special-status vertebrate, invertebrate, and plant species. Adverse impacts of a hazardous spill on the sandy beach or foredune environment would potentially result in direct mortality of wildlife and plant species. However, it would also likely contaminate or increase the mortality of invertebrates that

are forage material for wildlife species, particularly the western snowy plover, resulting in indirect negative impacts on individuals or their breeding success.

The impacts of hazardous pollutants on terrestrial biological resources would depend on factors such as the physical and chemical properties of the pollutant, specific environmental conditions at the time of the spill, and the species present. Certain types of communities would be more severely affected by a spill than others. Vegetation recovery would potentially be slow in areas of contaminated sand because of lingering toxicity or altered soil characteristics. Furthermore, impacts resulting from the cleanup might be more substantial than the impacts of the spilled pollutant, depending on the remediation method.

Impacts resulting from a hazardous pollutant spill may occur within the Project area and Off-site Project areas, depending on whether the spill occurred in the marine or terrestrial environment. Adverse impacts resulting from a spill may potentially be substantial depending on the size of the spill, and the environmental conditions at the time of the spill. Additionally, adverse impacts resulting from a potential spill may be short-term or long-term depending on the size of the spill as well as the method of remediation.

Avoidance and Minimization Measures

AMM TBIO-4a. Emergency Action Plan Measures Regarding Protection of Terrestrial Biological Resources. Before initiating offshore dredging or sand deposition activities the Applicant shall submit an Emergency Action Plan (EAP) to address protection of sensitive biological resources that would potentially be disturbed during a hazardous spill or subsequent cleanup activities. The EAP shall, at a minimum, include:

- Industry standard best management practices to avoid potential spills.
- Specific measures to avoid impacts on State-listed endangered and threatened species, California Department of Fish and Game species of special concern, and environmentally sensitive habitat areas, during response as well as cleanup operations.
- Identification, where feasible, of low-impact, site-specific, and species-specific remediation techniques.
- Identification of standards of a spill response personnel training program.
- An outline of a restoration plan including, preemptive identification of access and staging points as well as procedures for timely reestablishment of functional habitat values.
- A contact list of emergency response agencies to be retained at all job sites during construction activities.

AMM TBIO-4b. Maintain Equipment and Adhere to Work Plan. All equipment used on site or in dredging activities shall be properly maintained such that no leaks of oil, fuel, or residues will take place. Provisions shall be in

place to remediate any accidental spills, in both the terrestrial and marine environments. All equipment shall only be stored in the appropriate equipment staging areas.

The Applicant shall submit a work plan to the California State Lands Commission, the California Coastal Commission, the California Department of Fish and Game, and the city of Malibu for review and approval prior to any dredging or sand deposition activities. The work plan shall include a list of all heavy equipment and shall require all equipment to be stored and fueled in the 0.25-acre area within the Zuma Beach parking lot, which shall be conspicuously demarcated. Heavy equipment and construction activities shall be restricted to the defined construction areas, as demarcated by the Project engineer. Additionally vehicles and personnel shall only use existing access roads to the maximum degree feasible.

Rationale for Avoidance and Minimization Measures

Implementation of AMMs TBIO-4a and TBIO-4b would reduce long-term impacts to onshore sandy beach, dune, and freshwater aquatic habitat by providing contingency responses for accidental spills occurring in both the marine and terrestrial environment.

After implementation of AMMs TBIO-4a and TBIO-4b, substantial impacts to terrestrial biological resources from hazardous spills would be reduced, however, a spill would still result in the potential take of sensitive species.

Impact TBIO-5: Longshore Sand Transport Impacts to Terrestrial Biological Resources

Placement of sand on Broad beach would increase longshore sand transport and likely result in the widening of Zuma Beach down coast potentially adversely altering the hydrology of the Trancas Creek Lagoon and the Zuma Wetlands environmentally sensitive habitat areas (ESHAs), but potentially also increasing available sandy beach and dune habitats (Unsubstantial with Implementation of Avoidance and Minimization Measures, Class UI).

Impact Discussion

Proposed nourishment of Broad Beach would likely result in increased longshore sand transport of sand from Broad Beach down coast, potentially impacting Trancas Creek Lagoon, Zuma Beach, and the Zuma Wetlands. Substantial adverse impacts on the Off-site Project areas include potential changes in the hydrology of the Trancas Creek Lagoon as well as the Zuma Wetlands due to increased sand berm width interfering with lagoon mouth opening and tidal interchange. Both of these freshwater habitats, which are considered ESHA under the Malibu LCP, are periodically open to the marine environment (City of Malibu 1995), and have been identified by the NPS as potential habitat for southern steelhead. Increases in longshore sand transport, as a result of the

proposed beach nourishment, would likely result in the deposition of sand in the vicinity of Trancas Creek Lagoon and the Zuma Wetlands potentially reducing the overall period of time these lagoons are open to the ocean. This may have negative implications for the restoration efforts aimed at restoring southern steelhead or tidewater goby habitat. Further, as longshore sand transport may reduce the period of time that these lagoons are open to the marine environment the proposed Project may indirectly decrease the function value of these ESHAs. This potential adverse impact would be long-term; however, proposed backpassing would somewhat reduce these impacts by retaining sand on Broad Beach. Additionally, longshore sand transport resulting in a wider beach profile at Zuma Beach may increase habitat for sensitive species which require sandy beach habitat, such as the western snowy plover (BEACON 2007). This may constitute a beneficial impact, resulting in local population increases for a number of sensitive species, including the California least tern and the western snowy plover.

Longshore sand transport is not likely to affect the sites downcoast of Point Dume, as these areas are outside of the Project area's littoral cell. Therefore, as impacts to these areas would be negligible, they are not described in further detail.

Avoidance and Minimization Measures

AMM TBIO-5a. Maintain the Hydrology of Trancas Creek Lagoon and the Zuma Wetlands. Although the Trancas Creek Lagoon and the Zuma Wetlands may not be within the jurisdiction of the California State Lands Commission, as they provide habitat for wildlife and plant species, held under public trust by the California Department of Fish and Game (CDFG). Consequently these habitats are considered public trust resources. Prior to commencing sand deposition activities in the Project area, the Applicant shall prepare a Trancas Creek Lagoon and Zuma Wetlands Beach Berm Management Plan. This Plan shall be submitted to CDFG for review. The proposed Beach Berm Management Plan shall identify anticipated rate of sand deposition in front of the mouths of these water bodies and include potential measures to maintain the connection between these wetlands and the marine environment as determined appropriate by CDFG.

Rationale for Avoidance and Minimization Measures

Implementation of AMM TBIO-5a would reduce these long-term impacts to onshore freshwater aquatic habitat by providing for the maintenance of the connection between Trancas Creek Lagoon and the Zuma Wetlands to the Pacific Ocean. Through the maintenance of this connection, these water bodies will continue to be good candidates for restoration efforts focused on the recovery of southern steelhead populations.

After implementation of AMM TBIO-5a, impacts to terrestrial biological resources from longshore sand transport to the Off-site Project area would be unsubstantial.

Impact TBIO-6: Impacts to Terrestrial Biological Resources Resulting From Dune Restoration and Private Access

The proposed dune restoration would result in potential short- to mid-term beneficial impacts through enhancement of dune habitat values, as well as potentially increase in populations of special-status wildlife or plant species (Beneficial, Class B).

Impact Discussion

The proposed Project includes the deposition of 600,000 cubic yards of sand onto Broad Beach, creating a wide sandy beach backed by a system of sand dunes of up to 20 feet higher than mean lower low water (MLLW), which is the average of the lower low water height of each tidal day observed over a fixed time period (NOAA 2012). Up to 114 private access ways would traverse the dunes and would be bordered by unobtrusive access control features in order to preserve the ESHA restored under the proposed Project.

Although a detailed dune restoration has not yet been developed, properly developed dune restoration measures, outlined in AMM TBIO-1a, would be expected to result in potential substantial beneficial impacts over the 10 to 20 year Project horizon as dune restoration would potentially result in the direct increase of ESHA functional habitat value. Further, dune restoration activities would also potentially result in the introduction of suitable habitat for listed CNPS. Additional substantial beneficial impacts resulting from beach nourishment and dune restoration would potentially include long-term indirect increases in sensitive species such as the globose dune beetle, sandy beach tiger beetle, silvery legless lizard, and western snowy plover, each of which would benefit from the restoration of the ESHA (BEACON 2007).

However, large-scale dune restoration is a difficult process and requires large inputs of time and fiscal resources. Dune restoration also necessitates ongoing maintenance, weed removal, and remedial planting, possibly extending in excess of 10 years beyond the initial restoration activities. As the Applicant has yet to adopt a comprehensive dune restoration plan, with a feasible schedule and reasonably attainable success criteria, it is possible that the proposed restoration activities will be less than sufficient to restore an ESHA. This would result in substantial adverse impacts to

Ice plant, which is ranked as highly invasive by Cal-IPC reproduces vegetatively and would likely continue to invade the dune system, even after initial weed removal and restoration activities. Therefore, ongoing weeding efforts would be required until the dune community is fully established (which may take up to and beyond 10 years).

the ESHA in the short-term as dune building activities would likely result in the incidental take of sensitive species, such as the globose dune beetle, and/or CNPS-listed plants such as red sand-verbena, both of which may be adversely impacted by sand burial (BEACON 2007). Further, potentially adverse impacts in the mid- to long-term may also result as dune habitat degradation within the Project area may intensify due to the proposed Project's disturbance of the remnant dunes.

Additional substantial adverse impacts reducing the effectiveness and overall beneficial impact from the proposed dune restoration may result from habitat fragmentation caused by the creation of up to 114 private access walkways, approximately 5 to 8 feet in width, traversing the length of the restored dune habitat, the majority of which would overlie public lands. Although foot traffic across these private access walkways is expected to be minimal, current conditions at Broad Beach indicate that foot traffic creates a substantial impact in that clear access pathways are visible from the majority of residences. Consequently foot traffic on the proposed 114 pathways across the restored dune system would likely result in take (i.e., trampling) of dune plants, and may ultimately substantially reduce the potential benefits of dune restoration, as these pathways would create linear unvegetated bands through the ESHA. Further, indirect impacts as a result of private access walkways would likely include disturbance of wildlife due to interactions with residents and/or their pets (i.e., dogs or cats). Additionally, no access management plan is currently in place; therefore, private access over public land would be largely unregulated.

Additionally, following the cessation of the proposed Project in 10 to 20 years, sandy beach habitats would gradually erode, adversely impacting the newly restored dunes, which would have indirectly resulted in increased populations of special-status species over the lifetime of the proposed Project. Following the last backpassing activities, the restored dunes would likely eventually be eroded exposing the revetment and resulting in substantial adverse impacts to special-status species, including the globose dune beetle, sandy beach tiger beetle, silvery legless lizard, and the western snowy plover, all of which depend on coastal dune habitat. The erosion of the coastal dune environment would undermine all short to mid-term beneficial impacts of the proposed Project, resulting in substantial adverse long-term impacts.

Impact TBIO-7: Impacts to Terrestrial Biological Resources Resulting from Increased Public Access

The proposed beach nourishment would result in increased public access to Broad Beach, which may ultimately decrease the functional value of the restored dune system or result in an increase in incidental take, including harassment, of sensitive species (Unsubstantial with Implementation of Avoidance and Minimization Measures, Class UI).

Impact Discussion

Under the proposed Project lateral access through the entirety of the restored dry sandy beach, would be increased relative to the current conditions. However, adverse impacts resulting from increased access to Broad Beach would likely be less than substantial in the short to mid-term as the low key access control features, including the 25-foot privacy buffer and the informational signs would reduce direct adverse impacts on the dune system. However, following the cessation of the proposed Project, 10 to 20 years after the implementation of the proposed Project, it is likely that coastal erosion will again reduce lateral public access, prompting increased foot traffic within the 25-foot privacy buffer, and through the restored coastal dune. Consequently, adverse impacts to the restored dunes would become substantial over the long term, as trampling would likely result from increased public access and use.

Avoidance and Minimization Measures

AMM TBIO-7a. Restrict Access Across the Newly Restored Dune System. Access to and across the restored dune system shall be restricted to approved vertical access ways designated with a low-key rope and bollard fence as a means of conserving environmentally sensitive habitat area (ESHA) and limiting the adverse impacts associated with increased public access to the restored dune system. Such a rope and bollard fence shall be placed at the toe of the dune and along all approved vertical access ways in order to restrict all access to the dunes and accomplish the goal of reducing impacts to the newly created ESHA.

AMM TBIO-7b. Include Educational Signage Regarding Sensitive Wildlife and Plant Species. In addition to the low profile features meant to curb impacts to restored dune, educational signs shall be included along the length of the rope and bollard fence. These signs will help to educate the public and residents regarding sensitive dune species, reduce incidental take (including harassment) of sensitive species, and improve appreciation and enjoyment of public trust resources.

Rationale for Avoidance and Minimization Measures

Implementation of AMMs TBIO-7a and TBIO-7b would ensure additional protection for sensitive plant and wildlife species. Additionally, AMM TBIO-6b would increase public enjoyment of public trust resources.

After implementation of AMMs TBIO-7a and TBIO-7b, impacts on terrestrial biological resources from increased public access would be less than substantial.

Impact TBIO-8: Long-term Degradation and Erosion of Newly Created Environmentally Sensitive Habitat Area (ESHA)

Following the cessation of the proposed Project in 10 to 20 years, newly restored dune habitat would gradually erode, eventually exposing the revetment and likely leading to a return to emergency measures for protection of property not protected by the revetment or impacted by the degradation of the revetment (Unsubstantial with Implementation of Avoidance and Minimization Measures, Class UI).

Impact Discussion

Under the proposed Project an initial nourishment event would occur followed by periodic backpassing as well as a future renourishment event. However, in 10 to 20 years, following the renourishment event and the final backpassing activities marking the cessation of the proposed Project, Broad Beach will continue to erode. This would likely result in the eventual loss of sandy beach habitat and the degradation of the restored dunes, created under the proposed Project. As discussed in Impact TBIO-7 the loss of sandy beach habitat would intensify adverse impacts associated with public access.

Additionally, ongoing coastal erosion would potentially lead to the exposure of the revetment underlying the dunes leading to a substantial long-term adverse impact to newly created ESHA as well as special-status species in the Project area (see Impact TBIO-6). Further, the exposure of the revetment would see a return to emergency measures as a means of protecting private property not protected by the revetment or subject to impacts resulting from the degradation of the revetment. This may result in additional substantial adverse impacts to potential ESHA, as defined by the Malibu LCP, and restored habitats immediately behind the revetment.

Avoidance and Minimization Measures

AMM REC-5a (Requirement of Additional Nourishment) would apply to this impact.

AMM TBIO-8a. Preparation of an Environmentally Sensitive Habitat Area (ESHA) Protection Plan. Prior to commencement of any Project-related activities the Applicant shall submit a comprehensive dune restoration plan which would include a long-term ESHA protection plan as well as a public access protection plan, for approval to the California State Lands Commission (CSLC), the California Coastal Commission, the California Department of Fish and Game, and the city of Malibu. The plan would detail the various responsibilities of the Applicant as well as the relevant agencies in protecting newly created ESHA and lateral public access at Broad Beach. The plan would include adaptive management techniques and outline potential means to extend the life of the Project.

Rational for Avoidance and Minimization Measures

The proposed Project would result in short to mid-term substantial beneficial impacts to sensitive terrestrial biological resources and public access; however, there are no plans in place regarding the protection of these public trust resources following the cessation of the proposed Project. The implementation of AMM TBIO-8a would not necessarily mitigate the substantial adverse impacts associated with this long-term impact; however, it would begin a discussion regarding the long-term protection of these public trust resources.

Table 3.4-4. Summary of Terrestrial Biological Resources Impacts and Avoidance and Minimization Measures

Impact	Avoidance and Minimization Measures
TBIO-1: Impacts to Terrestrial Biological Resources Resulting from the Installation of the Emergency Rock Revetment	**AMM TBIO-1a**: Implementation of a Comprehensive Dune Restoration Plan
TBIO-2: Short-term Construction Impacts to Terrestrial Biological Resources	**AMM TBIO-2a**: California State Lands Commission (CSLC)- Approved Biologist and Biological Monitors for Construction Activities **AMM TBIO-2b**: Sensitive Resource Impact Avoidance **AMM TBIO-2c**: Protect Stockpiles of Excavated Material **AMM TBIO-2d**: Dredge Pipeline Staging Area Location **AMM TBIO-2e**: Prohibited Long-term Storage within the Temporary Dredge Pipeline Staging Area
TBIO-3: Long-term Construction (i.e., Backpassing) Impacts to Terrestrial Biological Resources	**AMM TBIO-3a**: California State Lands Commission (CSLC)- Approved Biologist and Biological Monitors for Backpassing Activities **AMM TBIO-3b**: Avoidance of Sensitive Resource Zones and Vegetation **AMM TBIO-3c**: Sensitive Biological Resources Report
TBIO-4: Hazardous Spill Impacts to Beach, Coastal Dune, and Coastal Wetland Biological Resources	**AMM TBIO-4a**: Emergency Action Plan (EAP) Measures Regarding Protection of Terrestrial Biological Resources **AMM TBIO-4b**: Maintain Equipment and Adhere to Work Plan
TBIO-5: Longshore Sand Transport Impacts to Terrestrial Biological Resources	**AMM TBIO-5a**: Maintain the Hydrology of Trancas Creek Lagoon and the Zuma Wetlands
TBIO-6: Impacts to Terrestrial Biological Resources Resulting from Dune Restoration and Private Access	Beneficial impacts to terrestrial biological resources would result from the proper implementation of AMM TBIO-1a
TBIO-7: Impacts to Terrestrial Biological Resources Resulting from Increased Public Access	**AMM TBIO-7a**: Restrict Access Across the Newly Restored Dune System **AMM TBIO-7b**: Include Educational Signage Regarding Sensitive Wildlife and Plant Species
TBIO-8: Long-term degradation and erosion of newly created Environmentally Sensitive Habitat Area (ESHA)	**AMM TBIO-8a**: Preparation of an Environmentally Sensitive Habitat Area (ESHA) Protection Plan